

In re Application of: Gad KEREN et al
 Serial No.: 09/839,643
 Filed: April 20, 2001
 Office Action Mailing Date: December 16, 2008

Examiner: Nguyen, Camtu Tran
 Group Art Unit: 3772
 Attorney Docket: 34948

In the Claims:

1-48. (Cancelled)

49. (Currently Amended) A method of decreasing blood pressure in a heart chamber, comprising:

implanting a shunt ~~with a valve element,~~ between a left atrium and a right atrium of the heart.

50. (Currently Amended) The method of claim 49, wherein said implanting is effected by ~~includes deploying~~ positioning said shunt through a septum of the heart and anchoring said shunt using ~~a tubular element having two ends and two fixation elements attached thereto~~ disposed at said two ends respectively.

51. (Previously Presented) The method of claim 49, comprising allowing an amount of blood suitable to substantially reduce blood pressure in the left atrium, to flow from said left atrium to said right atrium via said shunt when the pressure differential between said left atrium and said right atrium reaches a threshold.

59. (Currently Amended) A ~~shunt device~~ for decreasing blood pressure in a heart chamber, comprising:

a valve-shunt being positionable within a septum for ~~implanting~~ between a left atrium and a right atrium of the heart, and having fixation elements for attaching said shunt to said septum ~~in which the valve opens only when, said shunt being for enabling blood flow between said left atrium and said right atrium~~ a pressure level between opposite ends of the valve is above a threshold pressure greater than a normal pressure level over the cardiac cycle between the left atria and the right atria of a normal heart.

60. (Currently Amended) ~~A shunt according to~~ The device of claim 59, wherein said shunt further includes a ~~the valve allows passage of blood therethrough throughout the cardiac cycle.~~

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61. (Cancelled)

62. (Withdrawn) A shunt according to claim 59, wherein the valve is purely mechanical.

63-67. (Cancelled)

68. (Currently Amended) ~~A shunt according to~~ The device of claim 6759, wherein ~~the said shunt tube element~~ has a diameter of less than 5 mm.

69. (Currently Amended) ~~A shunt according to~~ The device of claim 6760, wherein ~~the said~~ valve is configured to allow passage of a relatively small volume of blood relative to an ejection volume of the heart.

70. (Currently Amended) ~~A shunt according to~~ The device of claim 6759, wherein ~~the said shunt tube element~~ has a length not substantially greater than a thickness of ~~walls between chambers of the heart~~ said septum.

71. (Currently Amended) ~~A shunt according to~~ The device of claim 59, wherein the said valve allows continuous flow of a small amount of blood.

72. (Currently Amended) ~~A shunt according to~~ The device of claim 71, further comprising a pump which induces the continuous flow of blood through the valve.

73. (Currently Amended) ~~A shunt according to~~ The device of claim 5960, wherein ~~the said~~ valve is capable of opens gradually gradual opening and/or closing.

74-77. (Cancelled)

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78. (Currently Amended) ~~A shunt according to~~ The device of claim 7759, wherein ~~the valve is located in a tube and wherein a first one of the said~~ fixation elements is are ~~located on attached to a first end of the tube and a second one of the fixation elements~~ is located on a second end of the tube opposite sides of said shunt.

79-83. (Cancelled)

84. (Currently Amended) A method of controlled decreasing of blood pressure in a heart chamber, comprising:

~~providing a valve adapted to operate within a heart; and~~

implanting a ~~the~~ valve in a heart between two heart atria, such that ~~the said~~ valve opens responsive to a pressure level of an exacerbated state of heart failure but not under normal pressures of systole and diastole of a normal heart.

85. (Cancelled)

86. (Currently Amended) The method of claim 84, wherein implanting ~~the said~~ valve in the heart comprises implanting between a left atrium and a right atrium, such that opening ~~the said~~ valve allows flow of blood from the left atrium to the right atrium.

87. (Currently Amended) The method of claim 84, wherein ~~providing the valve comprises providing a~~ said valve is configured to open only when the pressure in the left atrium is above a predetermined threshold.

88. (Currently Amended) The method of claim 87, wherein ~~providing the valve comprises providing a~~ said valve is configured to open only when the pressure in the left atrium is above 12mmHg.

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89. (Currently Amended) The method of claim 84, wherein implanting said valve comprises implanting in a manner which leads blood to ~~the~~ a right ventricle of said heart.

90. (Currently Amended) The method of claim 84, wherein implanting ~~the~~ said valve comprises implanting in a septum.

91. (Cancelled)

92. (Currently Amended) A method according to claim 84, wherein ~~the~~ said valve allows passage of blood therethrough only during diastole.

93-96. (Cancelled)

97. (Currently Amended) A method according to claim 84, wherein ~~providing the valve comprises providing a~~ said valve including includes a sensor for sensing a state of the heart and wherein ~~the~~ said valve opens at least partially responsive to readings of ~~the~~ said sensor.

98. (Currently Amended) A method according to claim 84, wherein ~~the~~ said valve is configured to open when the heart suffers from an exacerbated absolute arterial pressure or an exacerbated differential arterial pressure.

99. (Currently Amended) A method according to claim 84, wherein ~~the~~ said valve is configured to close after drainage of an amount of blood sufficient to reduce the mean left atrium pressure by 5mmHg.

100. (Currently Amended) A method according to claim 84, wherein ~~the~~ said valve is configured to open ~~responsive in response to~~ a differential pressure level between its opposite ends.

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101. (Currently Amended) The method of claim 84, wherein ~~implanting the said~~ valve ~~comprises is~~ implanting implanted in via a percutaneous procedure.

102. (Currently Amended) The method of claim 84, ~~comprising puncturing a transseptal hole and wherein implanting the~~ said valve comprises is implanting the valve ~~in the a~~ transseptal hole.

103. (Currently Amended) A ~~shunt device~~ for installation in a heart, comprising:
 a ~~valve shunt suitable for operation~~ implantable in a septum between atria of the heart;
 a sensor adapted to sense a parameter indicative of a state of the heart; and
 a controller adapted to ~~open the valve at least partially~~ control flow through said shunt in responsive response to readings from the sensor.

104. (Currently Amended) ~~A shunt according to~~ The device of claim 103, wherein said sensor comprises a pressure sensor.

105. (Currently Amended) ~~A shunt according to~~ The device of claim 104~~103~~, wherein ~~said controller opens the~~ further comprising a valve when the pressure read by the sensor is above a highest pressure in the left atrium in a normal heart for regulating flow through said shunt.

106. (Currently Amended) ~~A shunt according to~~ The device of claim 105, wherein ~~said controller opens the said valve is configured to open when the said sensor~~ indicates a pressure above 12mmHg.

107. (Currently Amended) ~~A shunt according to~~ The device of claim 105, wherein ~~said controller opens the said~~ the valve is configured to open when the said sensor indicates a pressure above 15mmHg.

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108. (Currently Amended) ~~A shunt according to~~ The device of claim 105, wherein said controller opens said ~~the valve is configured to open_ when the said~~ sensor indicates a pressure above 20mmHg.

109-112. (Cancelled)